PROPERTIES OF SATURATED LIQUID D_2O

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Properties of saturated liquid heavy water, D_2O, are given in this table as a function of temperature from the triple point to the critical point. Properties are calculated from formulations adopted for general and scientific use by the International Association for the Properties of Water and Steam (IAPWS). The background (including uncertainties) for the equation of state used for vapor pressure, density, and heat capacity is given by Herrig et al. (Ref. 1), the background for the viscosity correlation is given by Assael et al. (Ref. 2) and the background for the thermal conductivity correlation is given by Huber et al. (Ref. 3). The unpublished surface tension correlation and other IAPWS formulations may be found on the IAPWS Web site <http://www.iapws.org>. The temperature scale is ITS-90. Column definitions for the table are as follows.

Column heading	Definition
t	Temperature, in °C
P	Vapor pressure, in kPa
ρ	Density, in kg m^{-3}
C_p	Isobaric heat capacity, in kJ kg^{-1} K^{-1}
η	Viscosity, in mPa s
λ	Thermal conductivity, in W m^{-1} K^{-1}
σ	Surface tension, in mN m^{-1}

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t/ °C	P/ kPa	ρ/ kg m^{-3}	C_p/ kJ kg^{-1} K^{-1}	η/ mPa s	λ/ W m^{-1} K^{-1}	σ/ mN m^{-1}
3.82*	0.66164	1105.3	4.247	2.068	0.569	74.93
10	1.0269	1105.9	4.224	1.669	0.579	74.06
20	1.9993	1105.3	4.200	1.243	0.594	72.61
30	3.7008	1103.2	4.186	0.9702	0.605	71.09
40	6.5465	1100.0	4.177	0.7836	0.614	69.52
50	11.117	1095.7	4.171	0.6496	0.622	67.89
60	18.196	1090.6	4.168	0.5498	0.628	66.21
70	28.804	1084.7	4.165	0.4732	0.632	64.47

80	44.237	1078.2	4.163	0.4132	0.635	62.67
90	66.094	1071.1	4.163	0.3652	0.637	60.82
100	96.307	1063.4	4.163	0.3262	0.638	58.93
110	137.16	1055.1	4.165	0.2940	0.637	56.98
120	191.31	1046.4	4.170	0.2672	0.636	54.99
130	261.77	1037.2	4.176	0.2446	0.634	52.95
140	351.99	1027.4	4.185	0.2254	0.630	50.87
150	465.74	1017.2	4.198	0.2088	0.626	48.75
160	607.23	1006.5	4.214	0.1945	0.622	46.59
170	781.01	995.2	4.234	0.1819	0.616	44.39
180	992.01	983.5	4.259	0.1708	0.610	42.16
190	1245.5	971.2	4.290	0.1610	0.604	39.90
200	1547.2	958.3	4.327	0.1522	0.596	37.61
210	1903.0	944.8	4.371	0.1442	0.589	35.29
220	2319.2	930.6	4.423	0.1369	0.580	32.95
230	2802.4	915.8	4.485	0.1303	0.571	30.59
240	3359.7	900.1	4.558	0.1241	0.561	28.22
250	3998.2	883.7	4.645	0.1184	0.550	25.84
260	4725.7	866.3	4.750	0.1131	0.539	23.45
270	5550.2	847.8	4.875	0.1080	0.527	21.07
280	6480.2	828.2	5.028	0.1032	0.514	18.69
290	7524.7	807.1	5.219	0.09860	0.500	16.33
300	8693.4	784.5	5.463	0.09408	0.486	13.99
310	9997.0	769.8	5.785	0.08961	0.470	11.68
320	11447	732.6	6.234	0.08510	0.454	9.428
330	13057	702.1	6.902	0.08043	0.436	7.238
340	14843	666.7	8.006	0.07541	0.418	5.141
350	16823	623.6	10.16	0.06973	0.399	3.173
360	19020	565.7	16.22	0.06267	0.384	1.405
370	21477	440.1	264.3	0.05032	0.516	0.0467
370.697**	21662	356.0				0

*triple point, **critical point

References

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